PRESSURE MOLDED PROTEINACEOUS WAFERS, INGREDIENT INCLUSIONS, COOKIES, AND WAFFLE FOOD PRODUCTS; PRESSURE MOLDING PROCESS METHOD, MASS BALANCED AND VISCOSITY SPECIFIC BATTER FOR THE MANUFACTURE OF THESE FOOD PRODUCTS, AND FINAL PROTEINACEOUS FOOD PRODUCTS DERIVED UTILIZING SUCH

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority of Provisional patent application serial No. 60/340,236, filed on Dec. 14, 2001.

FIELD OF THE INVENTION

[0002] This invention relates to high-protein, molded, baked wafer-waffle-cookie food products, the batter for such food products, and methods of making such food products.

BACKGROUND OF THE INVENTION

[0003] Currently, all molded, baked, wafer-waffle-cookie food products are made from high carbohydrate/fat/lecithin/water batter formulations, processed on expensive continuous process lines, utilizing molding plate and drum technology, including but not limited to large scale commercial equipment from Hebenstreit and Franz Haas. Such specialized process equipment systems have been designed for mixing, pumping, applying (depositing), molding, baking, and processing high carbohydrate-based batters and resulting final molded food products including

[0004] bars/cones/confections/inclusions/waffles/wafer cookies/pizzelles/fortune cookies. High protein batters and resulting food products cannot be easily processed on this equipment due to the fact these highly engineered standardized process systems have been designed specifically for handling high carbohydrate/water/fat/oil/lecithin batters having known properties.

SUMMARY OF THE INVENTION

[0005] The invention relates generally to a novel engineered mass balance batter formulation of proteins/carbohydrates to water with a specified viscosity range for commercially processable proteinaceous pressure molded fabricated food products including plain wafers/waffles/cookies, flavored wafers/waffles/cookies, layered wafer bars, enrobed wafer bars, flavored wafer bars, sandwich wafer snacks, proteinaceous inclusion ingredients, fabricated wafer inclusion bars/cookies/confections, crème filled wafer food products, cone products, wafer confections, and pizzelle wafer cookies, Chinese fortune cookies, and high moisture breakfast waffles.

[0006] However, the inventive engineered mass balance formulation of proteins/fat/lecithin/water/flavor systems, and carbohydrates, allows high-protein batters and resulting wafers to be processed on existing process equipment, without requiring extensive re-engineering and modification of the wafer equipment, including new wafer molding plate steam pressure release ports, batter mixing and pumping/piping systems, and batter applicator (depositing) heads.

[0007] The novel, edible, proteinaceous batter formulation is engineered for a necessary specific mass balance ratio for consistent manufacturing of the pressure molded food products on equipment designed specifically for standard high carbohydrate formulation batter processing. This inventive mass balance—viscosity controlled batter technology has been engineered to have process-related properties that are similar or identical to those of the standard high percentage carbohydrate-based batters and final food products, so that they can be processed on the equipment that is designed for such. It was discovered that the mass balance—controlled viscosity formulation ratio is crucial. Without the mass balance—viscosity ratio, a protein-based batter would significantly increase standard steam port pressure, with possible explosion ramifications; costly steam port modification of the standard process molding equipment would have to be undertaken, which would include re-engineering and manually modifying all of the wafer molding plate steam pressure release ports to specifically handle identified steam pressure requirements. In addition, the batter mix and pump systems would need to be modified to handle high batter viscosities, and plate applicator nozzles for the new batters would have to be modified for handling the high water, highly viscous batter application.

[0008] The novel technology addresses these items, for it is based on utilizing a formulation of proteinaceous materials, with select dispersant—agglomerated proteinaceous materials in conjunction with filler proteinaceous materials, or structural case hardening proteinaceous materials, and/or encapsulated proteinaceous ingredients and carbohydrates. This formulation is blended and mixed with a specific amount of water, desired sweetener/flavoring agent system, lecithin, and oil/fat, and blended thoroughly until well mixed and possessing a smooth batter-like property. The specific solids: water mass balance ratio is from 1.00:0.500 to 1.00:4.00, not including any fats or lecithin in the batter. The batter must also possess a viscosity of greater than 100 centipoise but less than 25,000 centipoise at 24° C. The specific formulation of proteinaceous material ingredients is designed to be broad, but allows for the use of combinations of whey protein isolate, modified wheat protein isolate, gluten, soy protein isolate, whey protein concentrate, textured wheat protein, instantized whey protein isolate, instantized whey protein concentrate, milk protein concentrate, milk protein isolate, instantized milk protein isolate, soy protein concentrate, instantized soy protein, hydrolized collagen, gelatin, hydrolyzed gelatin, rennet casein, acid casein, egg protein, caseinates, instantized caseinates, single cell proteins, and encapsulated and/or denatured and/or crosslinked versions of such in calculated ratios.

[0009] The formulation of proteins/carbohydrates is mixed with water to meet the engineered mass balance—viscosity requirements. It is then blended thoroughly to eliminate particle clumping. Lecithin, sweetener, flavor systems, and oil/fat are then added to the mixed batter and further blended and properly dispersed within the protein matrix. The batter is then pumped and directly applied to the molding plates or heated drum mold. The high temperature plates are then closed upon each other, sandwiching the batter or the heated drum turns. The water in the batter is converted to steam and flashed off through the steam pressure release ports. The food product is baked to desired moisture content of less then 25% but greater than 1%. The resulting final food product is a molded, structurally stable,